# Slip Casting: Wall Thickness and Casting Time

Casting rate constant from a test and the time to build a wanted wall thickness in a plaster mould, by the parabolic (filtration) casting law.

**Method:** Parabolic filtration law of slip casting

## Input parameters

Unit system: SI

| Parameter | Value | Unit |
|---|---|---|
| Wall thickness in the test | 6.0000 | mm |
| Casting time in the test | 30.000 | min |
| Wall thickness wanted | 8.0000 | mm |
| Time for which to predict thickness | 60.000 | min |

## Calculated results

| Parameter | Value | Unit |
|---|---|---|
| Casting rate constant L²/t | 1.2000 | |
| Time for the wanted thickness | 53.333 | min |
| Thickness after the prediction time | 8.4853 | mm |

**Notes for this case**

• The plaster draws water through the growing cast layer, whose resistance grows with its thickness, so the thickness grows with the square root of time: L² = K t. One test fixes K (reported here in mm² per minute); doubling the wall takes four times as long. K depends on slip solids, deflocculation, temperature and mould dryness, so test with production slip and moulds.

## Formula and method

$$L^2 = Kt, \quad t_2 = t_1 \left(\frac{L_2}{L_1}\right)^2$$

### Variables

| | | |
|---|---|---|
| $L_1$ | Wall thickness in the test | m |
| $t_1$ | Casting time in the test | s |
| $L_2$ | Wall thickness wanted | m |
| $t$ | Time for which to predict thickness | s |
| $K$ | Casting rate constant L²/t | - |
| $t_2$ | Time for the wanted thickness | s |
| $L(t)$ | Thickness after the prediction time | m |

### Method and standards

Slip casting.

### Assumptions and limits

- Constant slip and mould conditions.

### References

Parabolic filtration law of slip casting

## Report details

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|---|---|
| Report reference | FCC-75V9-WFHX (the same inputs always give the same reference) |
| Generated | 23 November 2026, 17:35 UTC |
| Calculator | Slip Casting: Wall Thickness and Casting Time |
| Method last reviewed | 17 November 2026 |
| Software release | FireCAD Calc, release of 22 November 2026 |
| Release checks | 3 reference cases of this calculator, computed independently, are checked on every release |

Results are for engineering estimation. Verify critical designs against the referenced standards and your own data.

### This calculator online

https://calc.firecad.com/chemical/ceramics-glass/slip-casting-wall-thickness-time

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.